

**Before the**  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Parts 1, 21, 73, 74 and 101 of	)	WT Docket No. 03-66
the Commission's Rules to Facilitate the	)	RM-10586
Provision of Fixed and Mobile Broadband	)	
Access, Educational and Other Advanced	)	
Services in the 2150-2162 and 2500-2690	)	
MHz Bands	)	
	)	WT Docket No. 03-67
Part 1 of the Commission's Rules - Further	)	
Competitive Bidding Procedures	)	
	)	MM Docket No. 97-217
Amendment of Parts 21 and 74 to Enable	)	
Multipoint Distribution Service and the	)	
Instructional Television Fixed Service	)	
Amendment of Parts 21 and 74 to Engage in	)	
Fixed Two-Way Transmissions	)	
	)	WT Docket No. 02-68
Amendment of Parts 21 and 74	)	RM-9718
of the Commission's Rules With Regard to	)	
Licensing in the Multipoint	)	
Distribution Service and in the	)	
Instructional Television Fixed Service for the	)	
Gulf of Mexico	)	

**Comment on Notice of Proposed Rules Making**  
**MDS/ITFS Spectrum**  
**An Educational Licensee/Operator Response**

PACE Telecommunications Consortium of Michigan (PACE) is a licensee/operator of ITFS spectrum providing educational programming and wireless broadband data services to educational entities in five contiguous counties located in the rural north central quadrant of the lower Michigan Peninsula.

In reviewing the Commission's NPRM, PACE concludes that the interest of the *rural* educational entities, a segment of the country's population whose telecommunications needs are often more difficult and more expensive to meet, differs considerably from its urban brethren and therefore, requires somewhat different considerations from the Commission in its rules making process.

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- A. **The Coalition Proposal for Spectrum Realignment with an Alternative Plan.** The proposed Coalition band plan should be replaced by a similar but slightly different Revised default band plan that would provide most licensees with an equal opportunity for maximizing technical applications.
- B. **Uses of Revised Default Band Plan:** The revised default band plan will aid the development of rural operations which employ three distinct uses of spectrum. The first and most obvious is the use of super cell(s) to obtain educationally viable economic scales. The second use of spectrum is to build mini-cells fed by the super cells where population pockets exist that are better served by such means. The third use of spectrum is to link together super cells in building a wide area wireless rural network thus avoiding the often-onerous costs in rural areas of leasing broadband wireline connectivity to the Internet.
- C. **Unlicensed Use of Unassigned ITFS Spectrum.** In many rural areas ITFS spectrum has been unused, not because it isn't needed by educational groups to insure broadband capability within their educational mantra but because there has been no filing window for new ITFS stations in eight years.
- D. **Transition to New Band Plan.** It can be assumed that significant numbers of channels have not been built and that no financial capital investment has been made in any facility other than application filings, petitions, reconsiderations, etc. Licensees of these channels who have not built should not be able to be a recipient of compensation but should be automatically assigned to the new band plan effective with the Commission's deadline or an earlier settlement date negotiated by a Proponent. The deadline for any negotiating should be no later than nine (9) months from the date of the Commission's Order granting the new rules and the deadline for implementation should be no later than 15 months from that date.
- E. **Spectrum Access to Cable and DSL Providers.** PACE's broadband ITFS operations in rural areas of Northern Michigan would likely be impacted negatively should spectrum be opened to cable and, to a lesser extent, DSL operators. Since Wireless represents a potential competitive force, cable and DSL with their substantial financial power may see their own wireless presence as a means to protect their existing business and, because of the thinness of the rural market, as a means of cutting the fledgling rural operator off at the knees. Most would say that competition is good for the consumer. PACE would say that it is the right kind of competition that benefits the consumer. However, to subject the wireless rural operator to a third competitor (one within its own spectrum) would be devastating to its economic viability.
- F. **Signal Strength Limits at Geographic Service Area Boundaries:** Limitations placed upon the power and antenna height of a base station fail to consider the almost endless variety of circumstances that a particular service may require. Signal strength at boundaries would provide the best universal protection to surrounding stations.
- G. **Unlicensed "Underlay" Operation.** The use of unlicensed or underlay operations in the 2500 to 2690 MHz band presents a number of problems and should be rejected.
- H. **Discontinuance, Reduction or Impairment of Service.** The transition to advanced wireless services whose offerings are still in their infancy will result in a staggered usage of spectrum over time particularly in rural areas, which the new rules should permit with limits.
- I. **Performance Standards.** The development of a rural broadband system particularly over a large geographical area is, for the most part, a work in progress. It is not possible, other than in generalizations, to determine the backbone needs, upload and download needs, and mini-cell deployments that would allow an operator to engineer and license each and

every channel before it is needed. Rural operators, in particular, need flexibility in bringing channels into service.

- J. **An Auction of Currently Unassigned ITFS Spectrum.** In rural areas, it would be beneficial to see only educational institutions and other restricted entities have access to available ITFS spectrum and only then if they are restricted for 5 years from leasing their excess capacity to a commercial entity unless there is already an established operator. This will eliminate most of the gold rush mentality that might harm the small rural operator already in early deployment of broadband or other advanced services and protect legitimate ITFS eligible entities in obtaining needed spectrum.

#### A. The Coalition Proposal for Spectrum Realignment with an Alternative Plan

##### Coalition Band Plan

Channel Designation	Lower Frequency	Upper Frequency		
A1	2500.0000	2505.5000	LOW POWER	Channels can be used for TDD or Upstream FDD
A2	2505.5000	2511.0000		
A3	2511.0000	2516.5000		
B1	2516.5000	2522.0000		
B2	2522.0000	2527.5000		
B3	2527.5000	2533.0000		
C1	2533.0000	2538.5000		
C2	2538.5000	2544.0000		
C3	2544.0000	2549.5000		
D1	2549.5000	2555.0000		
D2	2555.0000	2560.5000		
D3	2560.5000	2566.0000		
J	2566.0000	2572.0000	Guard Band	
A4	2572.0000	2578.0000	HIGH POWER	Channels can be used for high-power operations like existing ITFS TV.
B4	2578.0000	2584.0000		
C4	2584.0000	2590.0000		
D4	2590.0000	2596.0000		
E4	2596.0000	2602.0000		
F4	2602.0000	2608.0000		
G4	2608.0000	2614.0000		
K	2614.0000	2620.0000	Guard Band	
E1	2620.0000	2625.5000	F	Channels can be used for TDD or Downstream FDD
E2	2625.5000	2631.0000		
E3	2631.0000	2636.5000		
F1	2636.5000	2642.0000		
F2	2642.0000	2647.5000		
F3	2647.5000	2653.0000		
H1	2653.0000	2658.5000		
H2	2658.5000	2664.0000		
H3	2664.0000	2669.5000		
G1	2669.5000	2675.0000		

G2	2675.0000	2680.5000
G3	2680.5000	2686.0000
I	2686.0000	2690.0000

The Coalition's proposal for realignment of the ITFS/MMDS spectrum into Low Power-High Power-Low Power segments is the most suitable of the various proposals for rural operations. However, the distribution of channel assignments does not fairly give the majority of licensees an opportunity for full implementation/participation in a variety of technologies. Designating upstream and downstream channels for FDD would establish nationwide uniformity with its attendant benefits; however, to establish formal channel pairings might place some limitation upon an operator who does not have use of one of the pairs. This can be true of the H-Group of channels, which can often have three different licensees who each could have different agendas. The remaining ITFS and MMDS channel groups contain four channels each under one licensee. The revised band plan makes it possible for a 4-channel group to have 1 channel in the LBS, 1 channel in the MBS, and 1 channel in the UBS with 1 additional channel placed where needed. Each licensee, MDS and ITFS, then has the greatest degree of flexibility. PACE believes this revised plan should be the default plan selected by the Commission. A national consistency in identification of channels (A1 should retain the same spectrum in all markets) is needed yet licensees should be allowed to cooperate among themselves to decide where their channels will be located. For example, a licensee might decide with everyone's cooperation that their E1 and E2 channels will now be the A2 and B1 as shown on the default band plan. Thus the greatest degree of flexibility in a potential channel transition is achieved especially where an operator's access to a great number of channels is limited. PACE proposes a default band plan as follows:

#### Revised Default Band Plan

Channel Designation	Lower Frequency	Upper Frequency	
A1	2500.0000	2505.5000	LOW POWER
A2	2505.5000	2511.0000	
B1	2511.0000	2516.5000	
C1	2516.5000	2522.0000	
C2	2522.0000	2527.5000	
D1	2527.5000	2533.0000	
E1	2533.0000	2538.5000	
E2	2538.5000	2544.0000	
F1	2544.0000	2549.5000	
G1	2549.5000	2555.0000	
G2	2555.0000	2560.5000	
H1	2560.5000	2566.0000	
J	2566.0000	2572.0000	Guard Band
A4	2572.0000	2578.0000	HIGH POWER
B4	2578.0000	2584.0000	
C4	2584.0000	2590.0000	
D4	2590.0000	2596.0000	
E4	2596.0000	2602.0000	
F4	2602.0000	2608.0000	
G4	2608.0000	2614.0000	
H2	2614.0000	2620.0000	
K	2626.0000	2632.0000	Channels can be used for TDD or Downstream FDD

A3	2620.0000	2625.5000
B2	2625.5000	2631.0000
B3	2631.0000	2636.5000
C3	2636.5000	2642.0000
D2	2642.0000	2647.5000
D3	2647.5000	2653.0000
E3	2653.0000	2658.5000
F2	2658.5000	2664.0000
F3	2664.0000	2669.5000
G3	2669.5000	2675.0000
H3	2675.0000	2680.5000
I	2680.5000	2686.0000

Conversion of the entire 2500-2690 MHz band to low-power operations would not serve the rural community. PACE's deployment of two-way broadband services in rural Michigan uses high-power super-cell downstream transmissions with low-power upstream transmissions to serve sparsely populated areas. There is no economical alternative. Where there are pockets of population within its service area that do not "see" signal because of line-of-site issues, the use of repeaters to create low-power mini-cells or the use of developing non-line of site technology could be effective in providing service.

While PACE is using TDD technology in its super cell, the proposed band plan allows for maximum flexibility in the selection of a variety of technologies that allows the operator to deploy any number of systems to meet the educational needs.

The other band plan proposals limit this flexibility.

It is assumed that the Commission will allow licensees, if all licensees in the BTA agree to do so, to customize the band plan within their BTA or geographical service area to exchange the same channels with an ITFS licensee who also agrees to the changes. Notification would need to be made to the Commission of such changes so licenses, construction permits, and pending applications would clearly represent channel responsibility. For national uniformity A1, for example, would retain the same 5.5 Mhz. of spectrum but with a newly assigned licensee.

## **B. Use of Revised Default Band Plan**

The revised default band plan will aid the development of rural operations by allowing three distinct uses of spectrum. The first and most obvious is the use of super cell(s) to obtain educationally viable economic scales. The second use of spectrum is to build mini-cells fed by the super cells where population pockets exist that are better served by such means. The third use of spectrum is to link together super cells in building a wide area wireless rural network thus avoiding the often-onerous costs in rural areas of leasing broadband wireline connectivity to the Internet. While this use incorporates the use of point-to-point technology, high power is generally needed to achieve reliability over long path links particularly if the path is mostly over water.

PACE operates a 57-mile link between its Petoskey and Traverse City, Michigan hubs. It is anticipated that this point-to-point spectrum can be reused in certain areas where low power mini-cells are needed. PACE has been in contact with the adjacent authorized BTA holders who are also building a broadband wireless network to discuss the interconnection by wireless links of each operator's network creating a larger wireless network that can provide greater value to its educational entities. These interconnections will, in most cases, require "high" power point-to-point transmissions whose signal strength will exceed the normal boundary signal limits. For situations like these, adjacent service area licensees should be permitted to enter into agreements to permit signal levels across mutual boundaries in excess of the Commission's rules.

### **C. Unlicensed Use of Unassigned ITFS Spectrum**

PACE believes that eligibility to apply for new ITFS authorizations should be limited to the educational entities. The Commission should limit the commercial use or lease of these new licensees for a period of five years, to allow the incumbent licensees time to develop the difficult rural educational arena. Certain benchmarks should also be established to insure that the incumbent operator is fulfilling its mandate to provide actual service within its rural educational coverage area. Failure to meet these benchmarks could allow new operators to petition the Commission to enter service earlier.

There seems to be a feeling that the Commission sees “unused/unlicensed” ITFS spectrum to mean “unwanted” spectrum by the licensed community and as such might be better served if made available for unlicensed use. In rural areas, where the development of wireless system is in its infancy, the acceptance and growth of wireless broadband will gradually demand more and more spectrum especially where spectrum is also used to develop wireless backbones. PACE, in its projected development of its services in rural Michigan, sees the need to apply for additional ITFS spectrum as its operations mature.

In many rural areas ITFS spectrum has been unused, not because it is not needed by educational groups to insure broadband capability within their educational mantra but because there has been no filing window for new ITFS stations in eight years. Potentially large amounts of bandwidth will be needed within the self-contained networks of school systems. It is expected that such networks would also interconnect with commercial MMDS operations.

In PACE’s Petoskey operation, we have interconnected our network with the Petoskey BTA holders network to provide educational programming and broadband accessibility to a consortium of (22) k-12 school districts, (2) Intermediate School Districts, and several cable companies in order to provide low cost, high speed Internet and educational programming. This wireless network replaced slow and expensive wireline connectivity to the Internet. It is expected that as educational applications are developed, more and more bandwidth will be needed to meet these educational needs. PACE averages 2-3 calls per month from other educational and governmental entities that want to be added to this system, but we are reluctant to service them in fear of what the outcome of this NPRM will bring. Also additional ITFS channels are needed in order to provide adequate bandwidth to meet the needs of the educational entities currently using this system.

Our success in implementing a rural wireless system has been repeatedly demonstrated. For instance one school was somewhat reluctant to replace their wireline connectivity with the wireless service and decided to run half their computers on each system. The students quickly learned which computers performed better and actually rushed to class trying to insure they had the faster system. The following year only the wireless system was used. Out of the 22 school districts located in rural North Central Michigan, PACE now has 19 of those connected with broadband high-speed wireless connectivity. The needs of these school districts have increased to the point that additional bandwidth is needed to meet the expanding needs of video streaming and virtual classes in order to meet the state educational requirements for graduation amongst the smaller districts. Another school was established to deal with students who had significant academic deficiencies. Computer learning was a key component of this school’s approach to these students along with broadband access. The result was a remarkable improvement in the academic achievement of these students.

Many school districts are facing budget cuts from the Michigan State Department of Education and therefore need to look at consortium type offerings of classes, budget and finance personnel and others to continue providing mandated programs with less personnel. PACE is meeting the needs and challenges set forth, but without sufficient bandwidth and rule allowances, PACE will be forced to minimize or even terminate its operations.

Rather than assign spectrum to unlicensed use and later have to find other spectrum or clear the unlicensed use at some point in time, it would seem prudent to allow time for educational entities to realize

the value of their own broadband networks not just for connectivity to the Internet but connectivity between school facilities and between school districts. Larger and larger throughput will be required and, although commercial operators may provide Internet connectivity, the educational institutions themselves are finding it more economical to develop their own spectrum held networks. In some cases, the commercial entity will help facilitate this development.

#### **D. Transition to New Band Plan**

PACE does not lease any of its licensed channels, but has constructed all of its licensed system with State Grants, Federal Grants and local educational funds. To pay for conversion costs would be very expensive and would create such a hardship that PACE would be forced to shut down its operations.

#### **E. Spectrum Access to Cable and DSL Providers.**

Broadband operations in rural areas of Northern Michigan would be negatively impacted should eligibility be opened to cable and, to a lesser extent, DSL operators. The cable operator(s) have already made significant penetration into the residential market and to some extent the small business market. Since wireless represents a potential competitive force, cable and DSL with their substantial financial power may acquire wireless spectrum as a means to protect their existing business and, because of the thinness of the rural market, as a means of cutting the fledgling rural operator off at the knees.

The cable or DSL provider would use such an opportunity to discourage wireless competitors from entry into the business or cripple existing wireless operations thus protecting their coaxial or wireline businesses. The history of cable and ILEC DSL providers' anti-competitive practices should sufficiently discourage the Commission from opening up spectrum to this type of entity.

Most would say that competition is good for the consumer. PACE would say that it is the right kind of competition that benefits the consumer. Is it the Commission's intention to see this spectrum as competition against cable and DSL? Does the Commission see this spectrum as an opportunity to compete within itself?

One could consider the argument that in urban areas several wireless operators using this spectrum could exist in competition with each other as well as cable and DSL. The rural marketplace is another situation. It is well established that the cost of providing service in the rural educational arena is considerably greater than that of the urban educational arena. To subject the wireless rural operator to a third competitor (within its own spectrum) would be harmful to its economic viability as well

#### **F. Signal Strength Limits at Geographic Service Area Boundaries.**

It would seem that these subjects are inter-related. Limitations placed upon the power and antenna height of a base station fail to consider the almost endless variety of circumstances that a particular service may present (terrain, distance to education entities, need for super-cells, etc.) Applying the boundary maximum signal strength allows the operator the flexibility to determine what best works for that particular market place. Rules should also allow operators of adjacent service areas to enter into agreements that would allow boundary signal levels to exceed the established maximum level. In the real world this is generally irrelevant in that a response station's antenna located near a service area boundary will have its highly directive antenna pointed away from the boundary.

Restrictions on antenna height (including surrounding ground elevations) may or may not be a detriment in some fashion to the needs of the operator (and consumer). If boundary maximum signal strength is applied instead, then the operator will need to determine the effect of potential interference to its own operations within its own service area. It is not in the operator's best interest to have a response station using any more power than necessary.

### **G. Unlicensed “Underlay” Operation**

The use of unlicensed operations in the 2500 to 2690 MHz band presents a number of problems and should be rejected.

Until the Commission opens a window for new ITFS filings it cannot estimate the availability of such frequencies. There may very well be significant pent-up demand by ITFS eligible entities that most spectrum will be applied for to limit any practical national opportunity for unlicensed underlay operations.

In addition there may be anti-competitive motivations against an ITFS licensee, by the rural operator. As asked earlier, does the Commission see the public interest served by Wireless in this spectrum as a competitor with cable and DSL or does the Commission see Wireless in this spectrum competing among itself as well? In rural areas any competition within the spectrum will be economically destructive to all parties. Furthermore, in rural areas unlicensed may have less need beyond its already available spectrum.

### **H. Discontinuance, Reduction or Impairment of Service**

While providing service to the educational entities and public should be the primary consideration that allows for preservation of licenses and spectrum, the commission should allow for periods of non-use. Different geographical service areas will grow at different rates with additional channels put into service as the operation warrants. In the wireless cable service you either put on all the channels or you did not operate. The transition to advanced wireless services whose offerings are still in their infancy will result in a staggered usage of spectrum over time particularly in rural areas.

It should be expected that, as time goes by, additional channels would be placed into service as the demand grows. The speed with which additional channels are placed into service is highly dependent on the service area with rural areas being slower than urban areas.



## **I. Performance Standards**

The development of a rural broadband system particularly over a large geographical area is, for the most part, a work in progress. It is not possible, other than in generalizations, to determine the backbone needs, upload and download needs, and mini-cell deployments that would allow an ITFS licensee to engineer and license each and every channel before it's needed. Currently "unused" spectrum does not mean, "Unneeded" or "Unwanted spectrum". Rural ITFS operators, in particular, need flexibility in bringing channels into service

## **J. An Auction of Currently Unassigned ITFS Spectrum**

Until the Commission can determine the need of current ITFS eligible entities, it should not broaden the definition of eligibility. The Commission should limit commercialization by new ITFS authorization holders for a reasonable period of time.

In rural areas, it would be beneficial to see only educational institutions and other restricted entities have access to available ITFS spectrum.

Respectfully Submitted,

James Mick, Superintendent

PACE Telecommunications Consortium

Cheboygan-Otsego-Presque Isle Educational Service District

6065 Learning Lane Indian River, Michigan 49749

231-238-9394